AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A fiber optic measurement device comprising an optical frequency domain reflectometer (OFDR), comprising:

a laser light source for generating light;

a splitter for splitting the light from the laser and providing part of the light to a measurement path and part of the light to a reference path; and

a polarization diversity detector for combining light from the measurement path that includes a first interference signal having a first polarization and light from the reference path that includes a second interference signal having a second different polarization,

~~configured to employ~~ wherein the polarization diversity ~~detection~~ detector is configured to perform polarization diversity detection on the combined light that includes the first interference signal having the first polarization and the second interference signal having the second polarization without using a polarizing beam splitter.

2. (Currently Amended) The fiber optic measurement device according to claim 1, ~~further comprising~~wherein the polarization diversity detector includes:

a first coupler for receiving a first optical signal from a device or system under test and generating first and second coupler outputs;~~, and~~

a second coupler for receiving a second optical signal from a reference source and generating third and fourth coupler outputs;

a polarization controller (PC) for changing a polarization state of the third coupler output and generating a PC output;

a third coupler for receiving the first coupler output and the PC output and generating a first combined output; and

a fourth coupler for receiving the second coupler output and the fourth coupler output and generating a second combined output.

3. (Currently Amended) ~~The fiber optic measurement device according to claim 2, further comprising:~~A fiber optic measurement device comprising an optical frequency domain reflectometer (OFDR) configured to employ polarization diversity detection without using a polarizing beam splitter, comprising:

a first coupler for receiving a first optical signal from a device or system under test and generating first and second coupler outputs;

a second coupler for receiving a second optical signal from a reference source and generating third and fourth coupler outputs;

a polarization controller (PC) for changing a polarization state of the third coupler output and generating a PC output;

a third coupler for receiving the first coupler output and the PC output and generating a first combined output; and

a fourth coupler for receiving the second coupler output and the fourth coupler output and generating a second combined output.

4. (Currently Amended) The fiber optic measurement device according to claim ~~3~~2, further comprising:

a first detector for detecting a first power of the first combined output in a first projection plane, and

a second detector for detecting a second power of the second combined output in a second projection plane.

5. (Original) The fiber optic measurement device according to claim 4, further comprising:

processing circuitry for processing interference terms of the first and second powers in the first and second projection planes to determine one or more characteristics of the first optical signal.

6. (Original) The fiber optic measurement device according to claim 5, wherein the fiber optic measurement device accounts for polarization of the first optical signal without using a polarizing beam splitter.

7. (Original) The fiber optic measurement device according to claim 5, further comprising:

a second polarization controller for changing a polarization of the first optical signal before being received in the first optical coupler,

wherein the first and second polarization controllers are adjustable for calibrating the fiber optic measurement device,

wherein for multiple different settings of the second polarization controller resulting in multiple corresponding vector measurements at the first and second detectors, the processing circuitry is configured to calculate a vector calibration matrix using the vector measurements.

8. (Original) The fiber optic measurement device according to claim 7, wherein the processing circuitry is configured to correct detected vector measurements using the vector calibration matrix such that the corrected vector measurements result in a vector representation of the first optical signal in an orthonormal basis.

9. (Original) An optical frequency domain reflectometer (OFDR) configured to employ polarization diversity detection comprising:

a first coupler for receiving a first optical signal from a device or system under test and generating first and second coupler outputs;

a second coupler for receiving a second optical signal from a reference source and generating third and fourth coupler outputs;

a polarization controller (PC) for changing a polarization state of the third coupler output and generating a PC output;

a third coupler for receiving the first coupler output and the PC output and generating a first combined output;

a fourth coupler for receiving the second coupler output and the fourth coupler output and generating a second combined output;

a first detector for detecting a first power of the first combined output in a first projection plane;

a second detector for detecting a second power of the second combined output in

a second projection plane; and

processing circuitry for processing interference terms of the first and second powers in the first and second projection planes to determine one or more characteristics of the first optical signal.

10. (Original) The OFDR according to claim 9, wherein the OFDR accounts for polarization of the first optical signal without using a polarizing beam splitter.

11. (Original) The OFDR according to claim 9, further comprising:

a second polarization controller for changing a polarization of the first optical signal before being received in the first optical coupler,

wherein the first and second polarization controllers are adjustable for calibrating the fiber optic measurement device, and

wherein for multiple different settings of the second polarization controller resulting in multiple corresponding vector measurements at the first and second detectors, the processing circuitry is configured to calculate a vector calibration matrix using the vector measurements.

12. (Original) The OFDR according to claim 11, wherein the processing circuitry is configured to correct detected vector measurements using the vector calibration matrix such that the corrected vector measurements result in a vector representation of the first optical signal in an orthonormal basis.

13. (Currently Amended) A method performed in an optical frequency domain reflectometer (OFDR), comprising:

generating laser light;

splitting the laser light;

providing part of the laser light to a measurement path and part of the laser light to a reference path;

processing light from the measurement path that includes a first interference signal having a first polarization and light from the reference path that includes a second

interference signal having a second different polarization to perform polarization diversity detection on the combined light that includes the first interference signal having the first polarization and the second interference signal having the second polarization without using a polarizing beam splitter; and

-detecting one or more parameters of ~~an optical signal~~ light from the measurement path based on the ~~using~~ polarization diversity detection ~~without using a polarizing beam splitter~~.

14. (Currently Amended) The method according to claim 13, ~~further comprising~~wherein the processing includes:

receiving at a first coupler a first optical signal from a device or system under test and generating first and second coupler outputs;~~, and~~

receiving at a second coupler a second optical signal from a reference source and generating third and fourth coupler outputs.

15. (Original) The method according to claim14, further comprising:

changing in a first polarization controller a polarization state of the third coupler output and generating a changed third coupler output;

receiving at a third coupler the first coupler output and the changed third coupler output and generating a first combined output; and

receiving at a fourth coupler the second coupler output and the fourth coupler output and generating a second combined output.

16. (Original) The method according to claim 15, further comprising:

detecting a first power of the first combined output in a first projection plane, and

detecting a second power of the second combined output in a second projection plane.

~~The method according to claim 16, further comprising:~~

17. (Currently Amended) The method according to claim 16, further comprising:

processing interference terms of the first and second powers in the first and second projection planes to determine one or more characteristics of the first optical signal.

18. (Original) The method according to claim 17, further comprising:

changing in a second polarization controller a polarization of the first optical signal before being received in the first optical coupler;

for multiple different settings of the second polarization controller, generating multiple corresponding detected vector measurements;

calculating a vector calibration matrix using the vector measurements.

19. (Original) The method according to claim 18, further comprising:

correcting detected vector measurements using the vector calibration matrix such that the corrected vector measurements result in a vector representation of the first optical signal in an ortho-normal basis.